2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

Western proposes to reconfigure a segment of its existing electrical transmission system near Boulder City, Nevada and the Hoover Dam. The proposed project involves double-circuiting a portion of the Hoover-Mead # 5 and #7 230-kV Transmission Lines with the re-named Henderson-Mead #1 Transmission Line from a point near the Hoover Dam to the Mead Substation. The majority of the proposed alignment is within existing Western ROW, except where the Henderson-Mead #1 Transmission Line transfers from the Hoover-Mead #7 to the Hoover-Mead #5 Transmission Lines, near the Boulder City Substation and where the Henderson-Mead #1 deviates from the Hoover-Mead #5 near the Mead Substation. Another primary project component is adding fiber optic conduit and cable through existing tunnels (near Hoover Dam) and via overhead installation on the transmission line structures described above. Equipment and structures atthe A&N Switchyard would be removed.

Project Activities

Western's Proposed Action includes the following primary activities:

Disassembly and Removal of Existing Structures

Work crews would disassemble existing steel lattice transmission structures at the site, leaving the existing foundations in place at or below grade. The disassembled structures would be removed from the work sites. Structure removal activities would occur within the existing 200-foot ROW. In all, Western proposes to remove about 33 existing structures.

Ground Clearing andLeveling

Clearing of natural vegetation would be required for construction purposes (access and structure sites), clearances for electrical safety, long term maintenance, and transmission reliability. At each structure site, leveled areas, or pads (approximately 30 by 40 feet), would be needed to facilitate the safe operation of construction equipment; a work area, approximately 200-feet in diameter, would be required to assemble the structure, and for necessary crane maneuvers. Most of the existing structure sites that will be reused for the new structures would require minimal clearing and leveling.

Structure Assembly and Erection

Structure replacement activities involve mobilizing construction vehicles, equipment and poles along existing access roads, or new spur access roads to each structure site, installing foundations, and assembling and erecting the structures. Work crews wouldauger foundations with power drilling equipment. Sections of the new structures and associated hardware would be delivered to each structure site by truck. Erection crews would assemble new structures on the ground within the existing ROW and, using a large crane, position them in the previously augured foundation holes. Concrete would be poured in the foundation holes to secure the structure base. Structure replacement activities would occur within the existing 200-foot ROW except in areas near the Mead Substation and Boulder City Tap. Western proposes to erect about 49 newmonopole structures, 17 of which would be located in the same location as the previous structures and 32 of which would be constructed in new areas along the project alignment. Figure 2-1 depicts an existing steel lattice structure being removed and the base of a newly installed steel monopole structure.

Figure 2-1. Photographs of the removal ofan old steel lattice structure and the base of a newly installed steel monopole structure.

Conductor Placement

Conductor stringing would begin by installing insulators and sheaves. The sheaves are rollers attached to the lower end of theinsulators which are attached to the ends of each supporting structurecrossarm. The sheaves allow crews to pull individual cables through each structure until the cables are ready to be pulled

up to the final tension position. Workers would install temporary clearance structures consisting of vertical wood poles with overhead netting at the pole top. These would be located at road crossings and crossings of energized electric lines to prevent the sock line (manila rope or wire used to pull transmission line conductors into place) or conductors from sagging onto the roadway or other energized lines during the stringing operation.

Western would establish conductor pulling and tension sites along the proposed alignment. These sites are required to set-up tractors and trailers with the spooled cables that hold the conductors. All pulling and tensioning sites are proposed within the existing ROW.

Once the equipment is set-up, a light vehicle would pull the sock line between each supporting structure where access along the line is available. At each structure, the sock line would be hoisted to the crossarm and passed through the sheaves on the ends of the insulators. The sock line would be used to pull the conductor through the sheaves. The conductors would then be attached to the sock line and pulled through each supporting structure under tension. After the conductors are pulled into place, they are pulled to a pre-calculated sag and then tension-clamped to the end of each insulator. The final step of the conductor installation process is to remove the sheaves and install vibration dampers and other accessories.

Fiber Optic Cable Installation

Western proposes to install the fiber optic cable in the Hoover Dam Control Tunnel and connect it to the Hoover-Mead #7 Transmission Line originating in the Los Angeles Switchyard (Figure 2-2). The fiber optic cable installation on the reconfigured Hoover-Mead #7 and #5 Transmission Lines would require Western to replace one of the overhead groundwires. The fiber optic cable would also be carried along on single-circuit segments of the new Henderson-Mead #1 230-kV Transmission Line in place of the overhead groundwire. The fiber optic communication path would extend from the Hoover Dam to the Mead Substation. The fiber optic communication path would consist of duct cable where installed in the control tunnel and cable trench, and as a groundwire where installed overhead. The fiber optic cable would be installed in construction spreads consisting of equipment and crews managing various phases of construction for a given line segment. Crews would store all materials and equipment associated with the project at a set-up location on a previously disturbed site. The process of installing the fiber optic cable would require the same or similar action as conductor installation.

Figure 2-2. Photographs of Hoover Dam Control Tunnel with cabletrays which runs from the Hoover Power Plant to the Los Angeles Switchyard (shown on right).

The fiber optic groundwire contains dielectric (non-electric conducting) fibers encased in a metal jacket that protects the fibers and functions as the static line or overheadgroundwire. The fiber optic groundwire with its protective coating, including the metaljacket, is approximately one-half inch in diameter. The duct cable is similar in construction to thegroundwire but has a neoprene jacket and is installed in a polyvinylchloride (PVC) casing. The duct cable is slightly larger in diameter than the fiber optic groundwire. The fiber optic cable does not emit any noise, or electric or magnetic fields. Crews would attach the fiber optic groundwire near the top of each electrical transmission line structure above the electrical conductors. In the static position, the fiber opticgroundwire has dual properties: first, for protecting the electrical lines from lightning strikes, and second, as a fiber optic communication cable.

Right-of-Way Cleanup and Restoration

Western would ensure that construction sites, material storage yards, and access roads are kept in an orderly condition during the construction period. Crews would collect waste construction materials and rubbish from all construction areas daily, haul them away, and dispose of them at approved sites. All structure assembly and erection pads not needed for normal maintenance would be returned to their original contour and natural drainage patterns would be restored. The intent would be to restore all construction areas to their original condition, where feasible.

Operation and Maintenance

Western would use routine visual inspection to ensure proper transmission line operation and maintenance. Western anticipates the need to occasionally tighten hardware and replace damaged materials.

Estimated Ground Disturbance

Temporary and permanent ground-disturbing activities would occur from proposed transmission line construction, operation, and maintenance. Temporary ground disturbance is defined as disturbance occurring only during the construction phase of the project. Examples of expected temporary ground disturbance include locations where existing transmission line structures would be removed and no new structures would be erected, and temporary construction areas associated with new structure installation. Permanent ground disturbance is defined as disturbance that may occur over the life of the project. Permanent ground disturbance would occur as a result of access and spur road re-grading or construction, and at the new structure bases. Western provided examples of temporary and permanent ground disturbance activities and estimates of expected ground disturbance.

Specifically, temporary ground disturbance as result of project implementation would occur where:

- Existing structures would be removed (100-foot radius).
- New monopole structures would be installed atexisting structure locations (100-foot radius).
- New monopole structures would be installed in new locations (100-foot radius).
- Structure installation activities overlap (included in 100-foot radius).
- Wire pulling sites (125 by 125 feet per three miles).
- Wire splicing sites (10 by 50 feet per three miles).

Permanent ground disturbance as result of project implementation would occur where:

- Existing spur or access roads would be improved (0.3 acres per mile).
- New spur or access roads would be developed (1.7 acres per mile).
- Monopole structure bases would be installed (assume one 10-foot diameter foundation per structure).

As depicted in Table 2-1 and Figure 2-3, project construction activities would result in temporary disturbance of about 49 acres and the permanent disturbance of about four acres. Three staging areas, located in previously disturbed areas at the Mead Substation, Boulder City Tap and Hoover Switchyard area, are proposed for this project. As a result, no additional temporary or permanent ground disturbance for staging would be expected at any of these sites.

TABLE 2-1

SUMMARY OF GROUND DISTURBANCE ACTIVITIES

Disturbance Activity	Quantity or Distance	Estimated Temporary Disturbance	Estimated Permanent Disturbance
New structure installation in previously undisturbed areas	32	22.9 acres*	0.07 acres*
Areas where existing structures are removed and replaced with new structures	17	12.2 acres*	0.04 acres*
Areas with removed structures (no new structure installation)	15	10.7 acres*	0 acres*
Restored spur and access roads (re-grade)	8.8 miles	0 acres	2.6 acres
New spur and access roads	0.77 miles	0 acres	1.3 acres
Overlapping structure replacement activities	7	1.8 acres	0 acres
Wire pulling sites	3	1.1 acres	0 acres
Wire splicing sites	3	0.06 acres	0 acres
Staging areas	3	0 acres	0 acres
TOTAL	–	48.8 acres	4.0 acres

* Using a 100-foot radius, which equals ~0.715 acres per structure

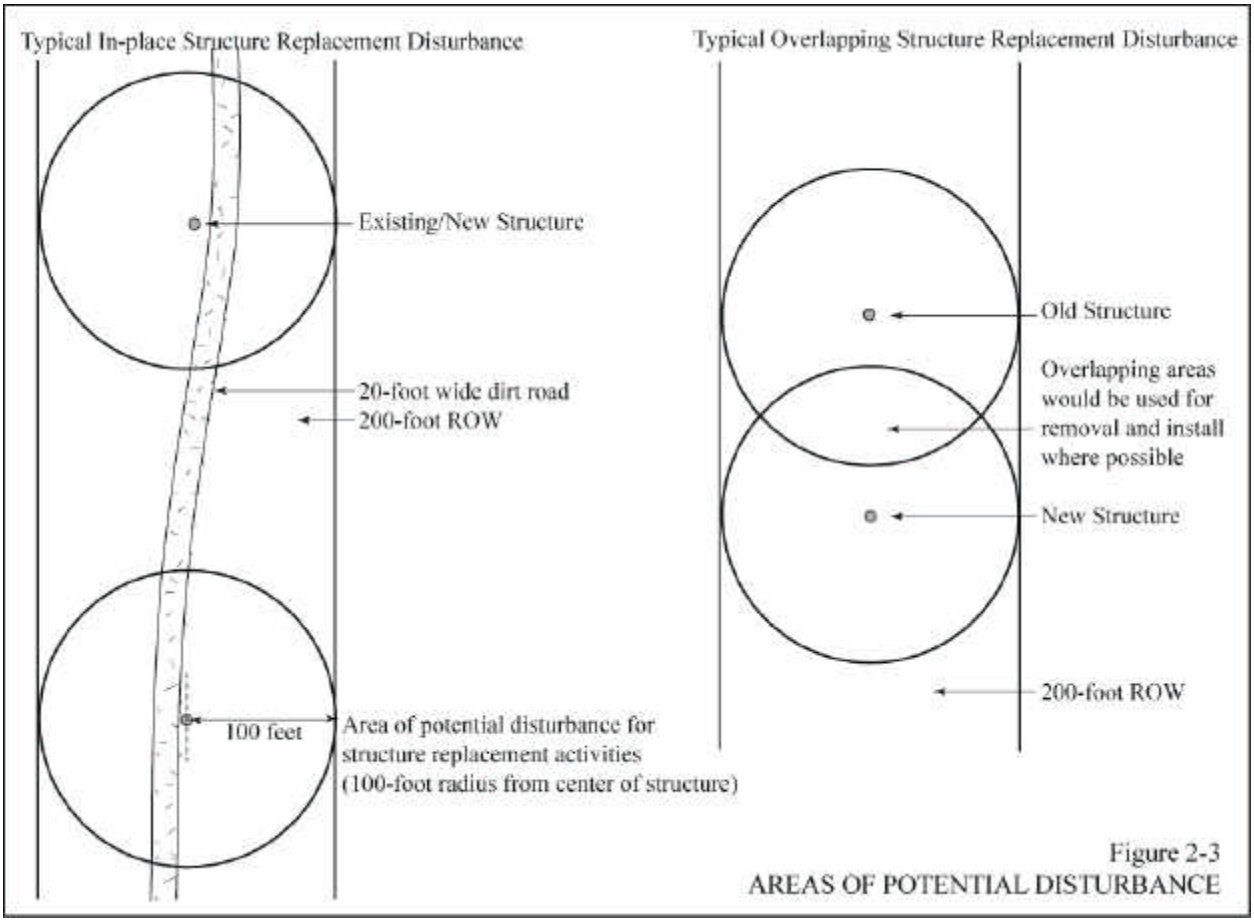

Figure 2-3
AREAS OF POTENTIAL DISTURBANCE

Personnel and Equipment

The approximate number of personnel and equipment required for construction activities needed for the double-circuit reconfiguration project is shown in Table 2-2.

TABLE 2-2
TYPICAL PERSONNEL AND EQUIPMENT FOR TRANSMISSION LINE CONSTRUCTION

Activity	Persons	Equipment
Clearing of crane and assembly areas	2-4	Dozer and motorized grader, pickup trucks
Structure assembly and excavation of structures	6-12	4 to 6 pickup trucks, line truck, tractor/pole trailer, auger truck, and/or backhoe
Removal of existing structure and erection of new structure	6-8	2 cranes (35 to 50 ton capacity), 2 pickup trucks, aerial man-lift
Clean-up	3-6	Large fork-lift, flatbed and/or pickup trucks with associated trailers

2.2 ALTERNATIVES

No-action Alternative

The No-action Alternative means that no changes would occur to the present Henderson-Hoover, Hoover-Mead #7 and Hoover-Mead #5 230-kV Transmission Lines. The lines would continue to operate as is with no provisions for a double-circuit reconfiguration. If the reconfiguration was not conducted, the purpose and need of the project would not be met and Western's electrical transmission system would be disrupted.

Alternatives Considered but Eliminated from Further Consideration

Seven electrical transmission reconfiguration options were developed by Western and presented in the Hoover Dam Bypass Project EIS. Three of the seven options involved removing the A&N Switchyard and replacing a single-circuit line with a double-circuit line to the Mead Substation, which is addressed as Phase II.

In Phase II, removing the A&N Switchyard and replacing a single-circuit line with a double-circuit line to the Mead Substation are directly a result of the Phase I work covered under the Hoover Dam Bypass Project EIS. The following alternatives were reviewed and dismissed from further consideration.

- A new single-circuit 230-kV transmission line from a Hoover Dam switchyard to the Mead Substation would require new ROW and extensive environmental review and was therefore

eliminated from further consideration. The last existing ROW corridor was developed by the Colorado River Commission and the Nevada Power Company.

- Double-circuiting the new Henderson-Mead #1 230-kV Transmission Line with the Existing Hoover-Mead #1 230-kV Transmission Line from the A&N Switchyard to the Mead Substation was dismissed. The northern portion of this transmission line (approximately four miles) is accessible by foot or helicopter only, requiring either new access roads to structure locations, or hand-labor and helicopter construction methods. As a result, Western determined this alternative not feasible and eliminated it from further consideration.
- Fiber optic cable replacement on the Hoover-Mead #1 230-kV Transmission Line from Hoover Power Plant to the Mead Substation was also discussed. The current fiber optic cable is outdated, not allowing for new compatible connections. Replacing the fiber optic cable with new cable to increase capacity and compatibility results in the same restricted access issue as described above; the alternative was therefore eliminated from further consideration.

2.3 RESOURCE PROTECTION MEASURES

Western would incorporate the following resource protection measures into project construction specifications to protect natural, human, and cultural resources in the project area. These protection measures have been approved by Western's Desert Southwest Region for all construction activities and are designed to minimize, reduce, or eliminate impacts of the Proposed Action. Specific mitigation measures that would be implemented to reduce impacts to particular environmental resources are described in Chapter 4 – Environmental Consequences.

Land Use

- The ROW, temporary construction areas, access road buffer zones, and staging areas would be restored as near to the original condition as practicable. Where necessary, land would be restored to its original contour and natural drainage patterns along the ROW.
- All construction vehicle movement outside the ROW would be restricted to pre-designated access or public roads and the areas authorized for use beyond the existing ROW.
- Existing laydown areas would be used to store equipment and supplies during construction. Western would confer with the Bureau of Reclamation (BOR) on utilization of existing areas for use as a laydown area.
- No new material sources (borrow sites) would be utilized or required for construction. Other aggregates may come from readily available commercial sources in Boulder City, Las Vegas, and Kingman.

- In the event of property damage caused by the activities of Western personnel or contractors, Western would quickly investigate and reasonably attempt settlement with the party who incurred property damages.

Biological Resources

- Wherever possible vegetation would be left in place and the original contour would be maintained. The objective of this measure is to avoid excessive root damage and allow for re-sprouting.
- Holes would be covered at the end of each construction day to prevent wildlife from entering unfilled auger holes.
- Trash would be stored in scavenger-proof containers and removed from the field at the end of construction activity each day.
- Speed limits along the ROW and access roads would be restricted to 15 miles per hour.
- All construction vehicles would be washed prior to initial ingress to the project area to prevent the intrusion of invasive weeds.
- Fill, rock, or additional topsoil would be obtained from the project area (ifriprap is obtained from sources outside the project area, it would be cleaned prior to entering the project site).
- Desert soils would be stored on or near its original location to minimize impacts to vegetation, reduce the potential for compaction and erosion of bare soils, and minimize the spread of invasive species (if possible, desert soil replacement techniques would be used to re-establish desert crust surfaces).
- No imported topsoil or hay bales would be used for erosion control.
- Special status species or other species of particular concern would be considered during project implementation under Western's guidance. This may entail conducting surveys for plant and wildlife species of concern in temporary use areas. In cases where such species are identified, appropriate action would be taken to avoid adverse impacts on the species and its habitat and may include monitoring construction activities.
- Biological monitors would inspect areas identified for ground clearing and leveling for active bird nests prior to the start of these activities. Actions would be taken to ensure no migratory birds, their nests, or nest contents would be harmed during construction.

Cultural Resources

- Management recommendations for National Register-eligible archaeological sites and traditional cultural properties include restrictions to access along existing roads, restricting structural maintenance to certain areas to avoid impacting sites, and having an archaeological and/or tribal monitor present, if needed, during construction.

- Western would continue to consider cultural resources during post-EA phases of project implementation. In consultation with the State Historic Preservation Officers, Western would develop and implement specific mitigation measures to minimize any identified impacts. These may include modifying the project to avoid adverse impacts, monitoring of construction activities, and conducting data recovery studies.

Visual Resources

- The limits of construction activities would be predetermined, with activity restricted to and confined within those limits.
- No paint or permanent discoloring agents would be applied to rocks or vegetation to indicate limits of survey or construction activity.
- In designated areas, Permeon or similar product would be applied to disturbed rocky surfaces to resemble desert varnish. This would be applied under contract to the FHWA once the Hoover Dam Bypass Project and Western's Phase I and II construction have been completed.

Air Quality

- All applicable permits pertaining to dust abatement and blasting would be obtained and maintained.

Water Resources

- Western would ensure that all construction activities minimize disturbance to vegetation, drainage channels, and stream banks.
- Construction methods shall be designed to minimize erosion and would include installation of cross drains, placement of water barriers adjacent to the road, and the application of Best Management Practices. Western's standard construction specifications require the contractor to obtain any and all necessary Federal and State permits required for stormwater run-off, including a NPDES permit.

Geology and Soils

- Except where necessary for the safe installation of the new structures, measures would be taken to confine vehicle traffic to the existing roads within the ROW and minimize the disturbances to the soil protective mechanisms (i.e., the algal crusts, desert pavement, and vegetation).
- No construction would occur when the soil is too wet to adequately support construction equipment. If grading operations associated with replacing a pole have altered the original ground topography, crews would reshape the ground surface to approximate the original topography.
- In construction areas where ground disturbance is substantial or where re-contouring is required, surface restoration would occur as required by land management agencies. The method of restoration

typically includes returning impacted areas back to their natural contour, installing cross drains for erosion control, placing water bars in the road, and filling ditches.

- If construction crews find paleontological resources during construction activities, Western would meet or exceed the National Park Service's (NPS) guidelines on paleontological resource management.

Noise

- All engine-powered equipment would have mufflers installed according to the manufacturer's specifications and would comply with applicable equipment noise standards.
- Construction crews would locate stationary construction equipment as far from nearby noise sensitive properties as possible.
- Idling equipment would be shut off when possible.
- Construction operations would be rescheduled to avoid periods of noise annoyance, as determined through consultation with the BOR and NPS.
- Affected parties would be notified whenever extremely noisy work, including blasting, would occur.

Health and Safety

- During construction, standard health and safety practices would be conducted in accordance with the Occupational Health and Safety Administration's policies and procedures.

Hazardous Materials and Solid Waste

- A Spill Prevention Notification and Cleanup Plan would be prepared before construction.
- No debris would be deposited in the ROW or temporary use areas.
- Hazardous materials, fuels, and lubricants would not be drained onto the ground or into streams or drainage areas. Totally enclosed containment would be provided for all trash. All construction waste including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials would be removed to a disposal facility authorized to accept such materials.
- All fuel or hazardous waste leaks, spills, or releases would be reported immediately to Western, FHWA, and the Federal agency that administers the land where the incident occurs.
- Removing oil-filled equipment is not expected; however, if required, the oil must be removed and disposed of in accordance with Federal, State, and local laws.